CASE STUDY REPORT #50 & 50A
NEW MELONES PROJECT (INCLUDING GOODWIN DAM)
STANISLAUS RIVER

I. Project Description

The Stanislaus River originates near the crest of the Sierra Nevada draining an area of nearly 900 square miles above the New Melones project. Three major tributaries of the Stanislaus River -- the North, Middle and South Forks -- flow through steep rocky canyons before joining to form the main stem of the Stanislaus River in the headwaters of the New Melones Reservoir (see Figure 1).

There are many existing dams, diversions and powerhouses upstream of New Melones which influence the streamflow in the river (Figure 2).

Streamflow in the main stem below New Melones was first regulated in 1912 by Goodwin Diversion Dam and also since 1957 by Tullock Reservoir. Goodwin Dam, constructed by the Oakdale and the South San Joaquin Irrigation Districts, diverts water from a 70 surface-acre pool into two irrigation canals. About 10.5 miles upstream from Goodwin Dam, the same two irrigation districts constructed Melones Dam in 1926 which forms an 1,843-acre reservoir. Thereafter to conserve more of the natural runoff, the two irrigation districts completed in 1957 what was known as the Tri Dam project which consists of

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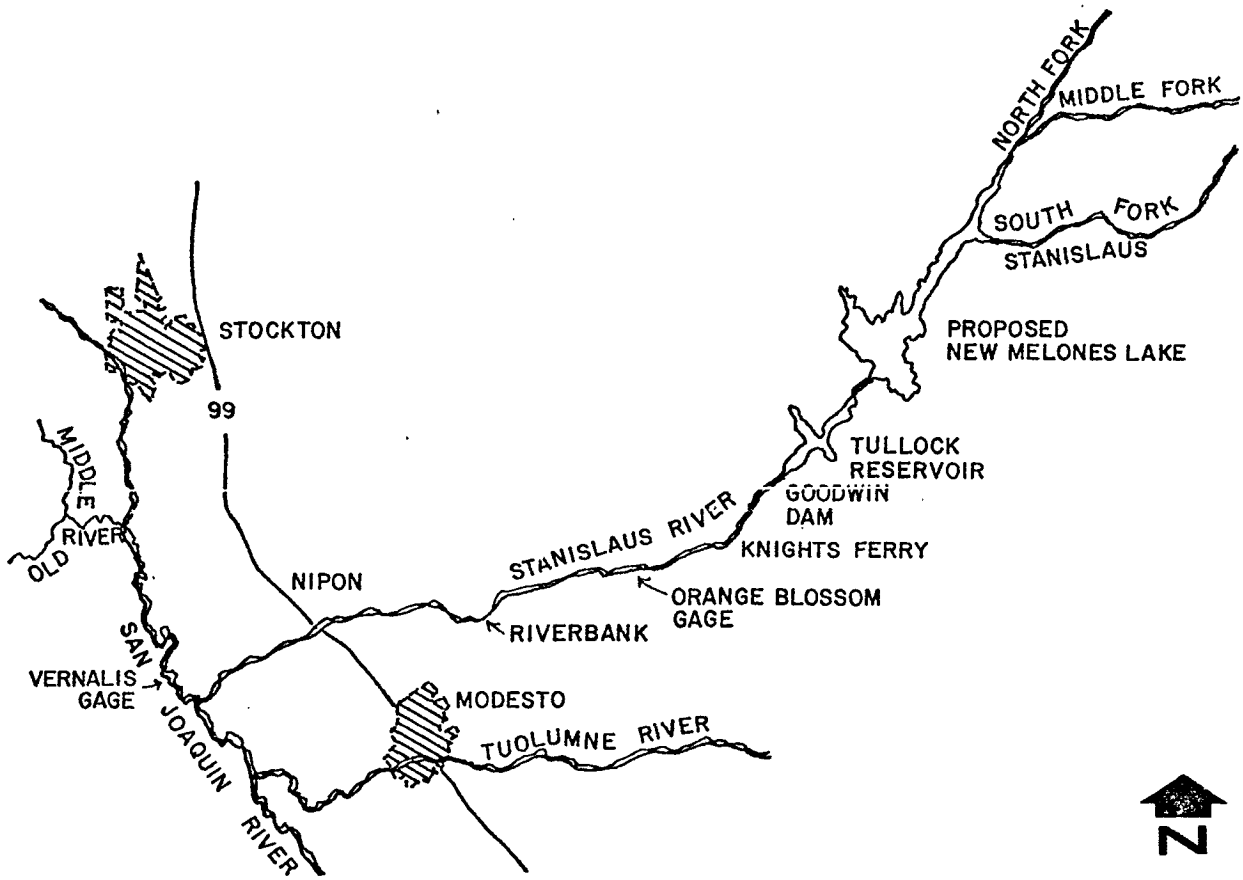
Figure 1

LOCATION MAP



Source: U. S. Army Corps of Engineers, 1972.

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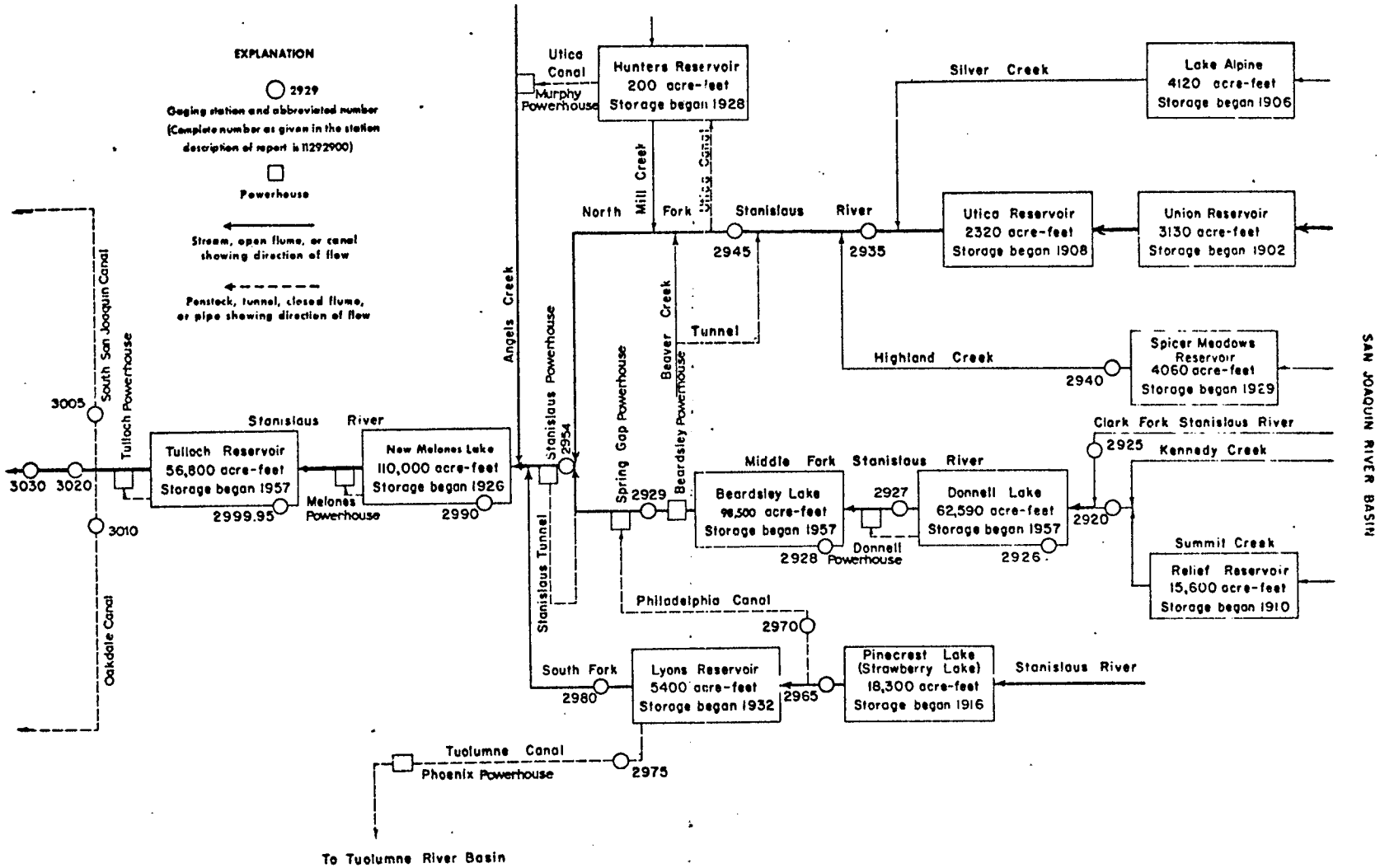

Figure 2

Source: U. S. Geological Survey, 1973, water resources data for California.

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Beardsley and Donnell Reservoirs located on the upper Middle Fork and Tullock Reservoir located between Goodwin and Melones Reservoir (see Figures 1 and 2).

The U. S. Army Corps of Engineers is presently completing a multi-purpose project, known as New Melones, on the Stanislaus River approximately three quarters of a mile downstream from the present Melones Dam and Reservoir. The new dam will inundate the existing Melones Dam and form a reservoir having a capacity of 2,400,000 acre-feet and covering 12,500 acres. The New Melones project will be operated and maintained by the U. S. Bureau of Reclamation and will be integrated into the Central Valley Project (CVP).

The project, when completed, will provide flood protection and water for water quality control and fish and wildlife maintenance along the Stanislaus River, lower San Joaquin River and possibly provide additional water for salinity control in the Delta.

II. Pre-Project Conditions

For New Melones, the pre-project period includes numerous water projects which preceded New Melones. The natural flow in the Stanislaus River had a seasonal pattern typical of other rivers originating in the western slopes of the Sierra Nevada. The wet season begins with the first major winter storms, usually in November or December and continues until June. The calculated (1901-1970) inflow to Melones Reservoir (Figure 3) exhibits the

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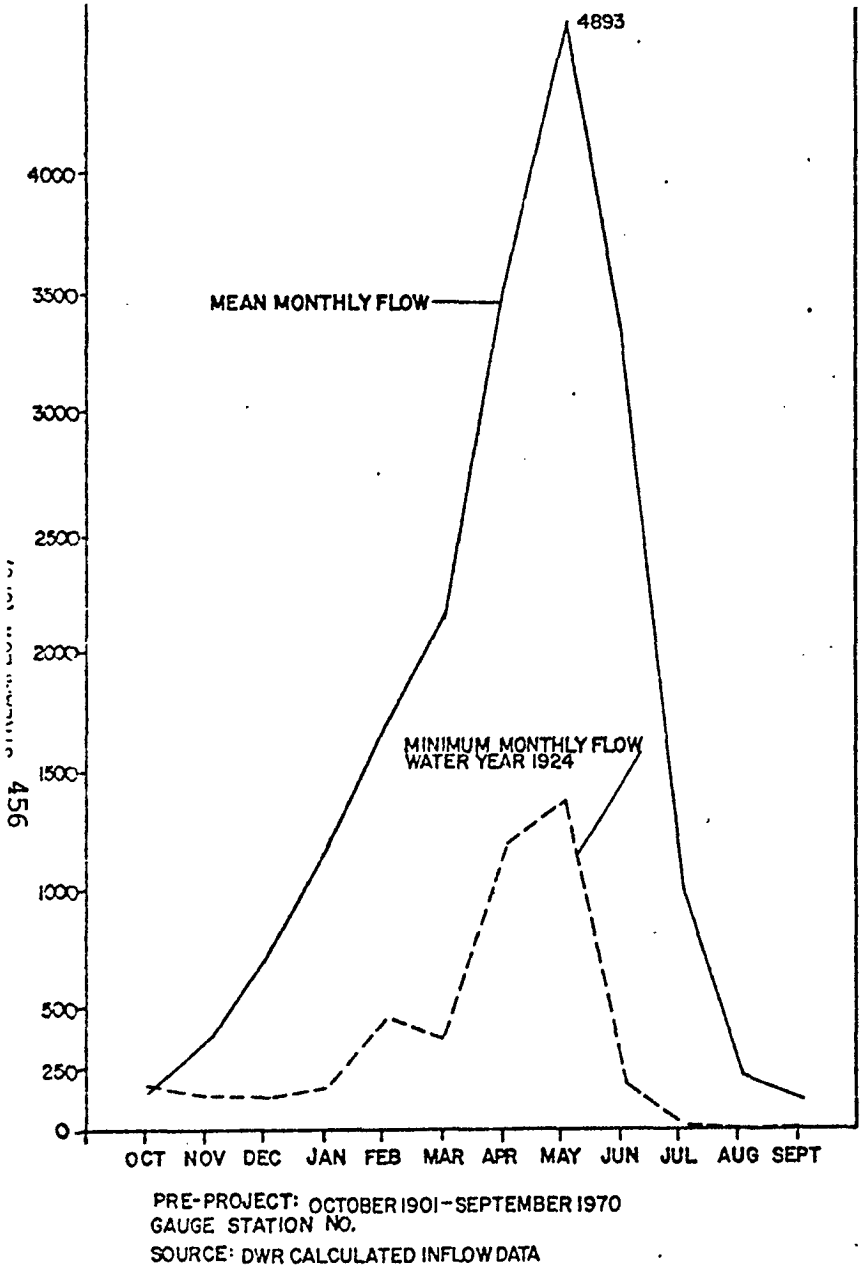

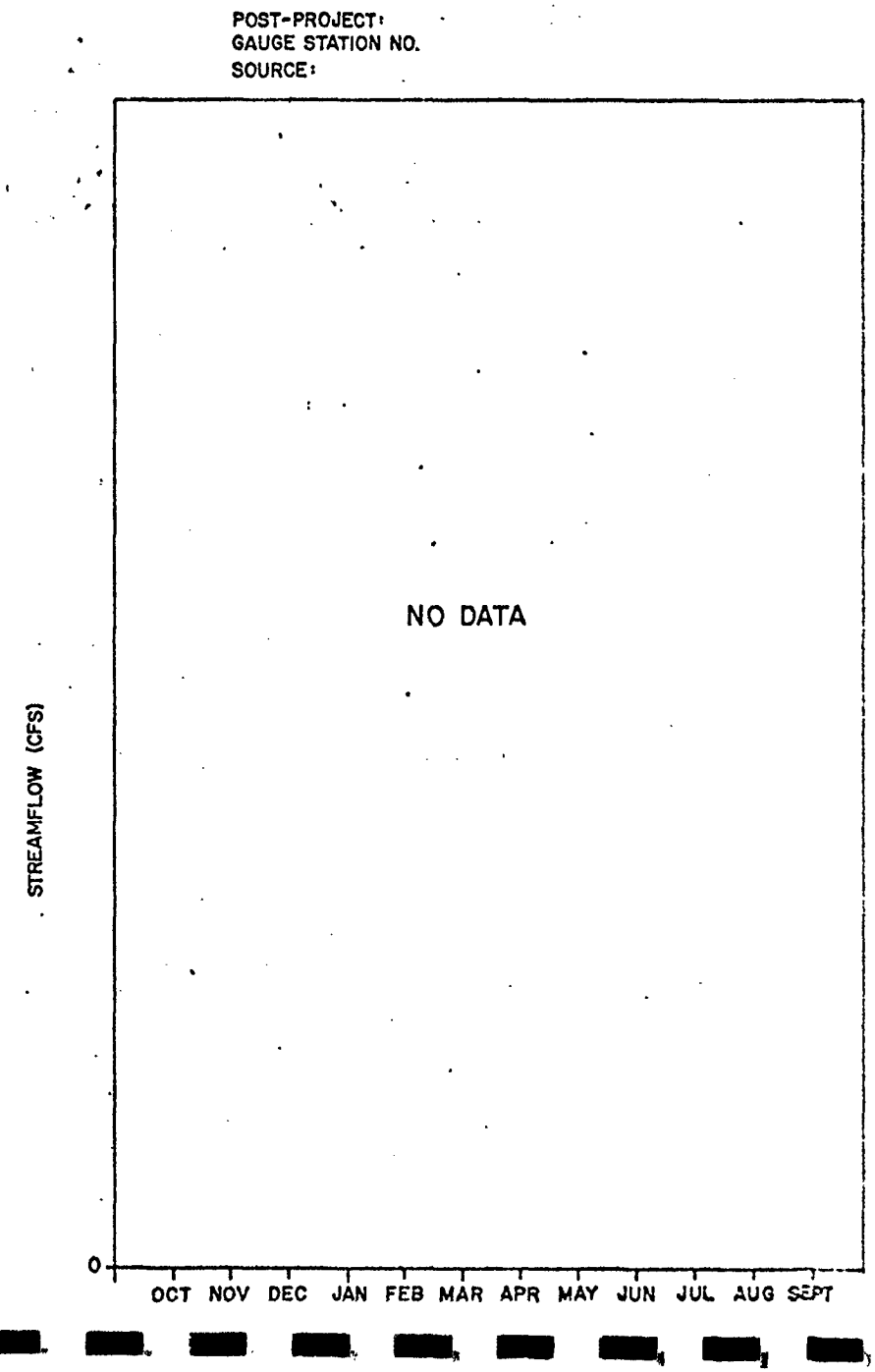

FIGURE 3
STREAMFLOW CONDITIONS, STANISLAUS RIVER
NEW MELONES RESERVOIR

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peak levels of runoff that occur in the spring months, March through June, as a result of the melting snow pack.

Relatively unimpaired, natural streamflow was measured (1903-1911) by the U. S. Geological Survey (USGS) flow gauge near the present Goodwin Dam site prior to construction of the dam (see Figure 4). Only a few small high elevation reservoirs existed during this period; thus river discharges reached the lower San Joaquin River without much impairment or diversion. Although similar, the pre-project flows shown in Figures 3 and 4 are noticeably different during the late fall-early winter period. The draughts of the 1930s probably contributed to this difference.

The Stanislaus River is one of the major tributaries of the San Joaquin River. It presently supplies approximately 25 percent of the San Joaquin River flow entering the Delta (as measured by the USGS gauge station at Vernalis).

Starting in the early 1900s, the construction of impoundments and powerhouses in the Stanislaus basin continually altered streamflow patterns. The amount of natural runoff recently diverted from the river was approximately 540,000 acre-feet. The annual average unimpaired discharge of the Stanislaus River exceeded the diverted amount by about 600,000 acre-feet. This discharge below Goodwin Dam maintains streamflows and water quality in the Stanislaus River and in the lower San Joaquin River.

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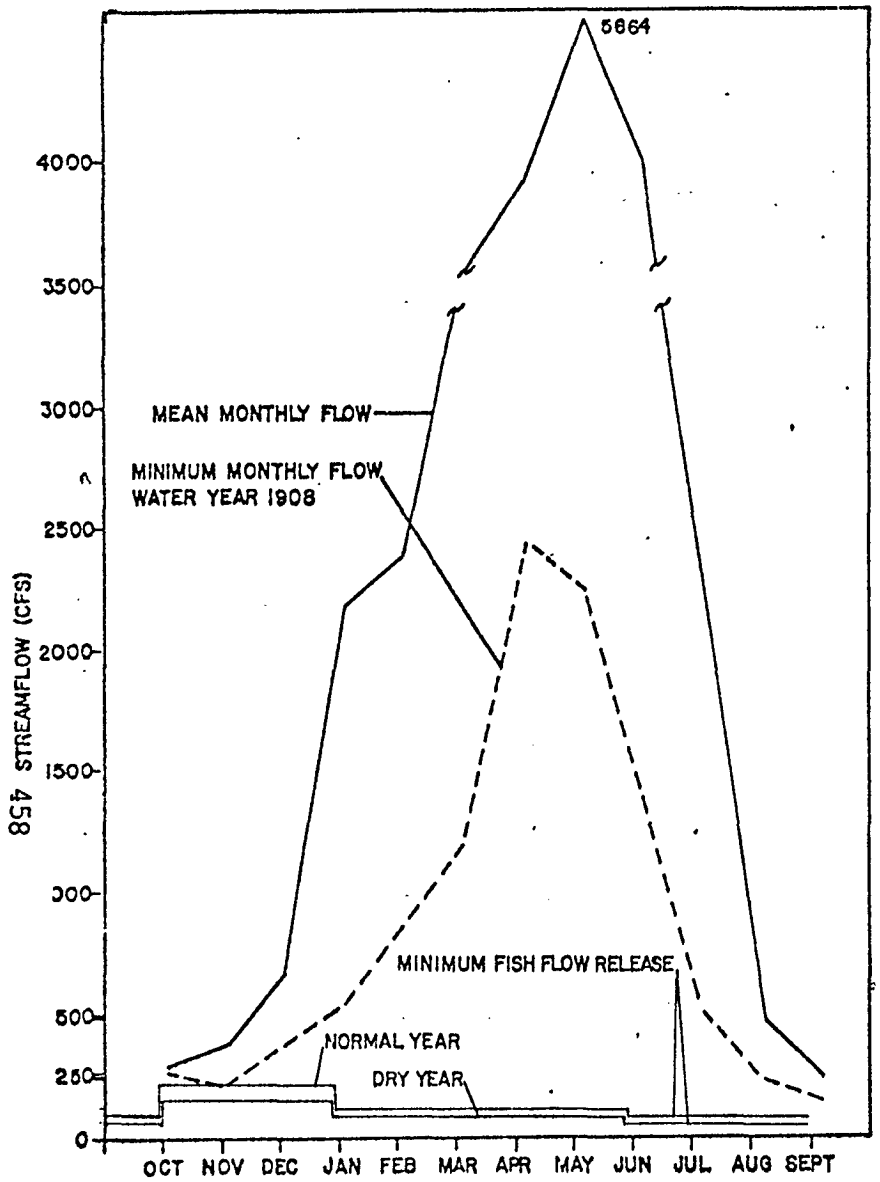
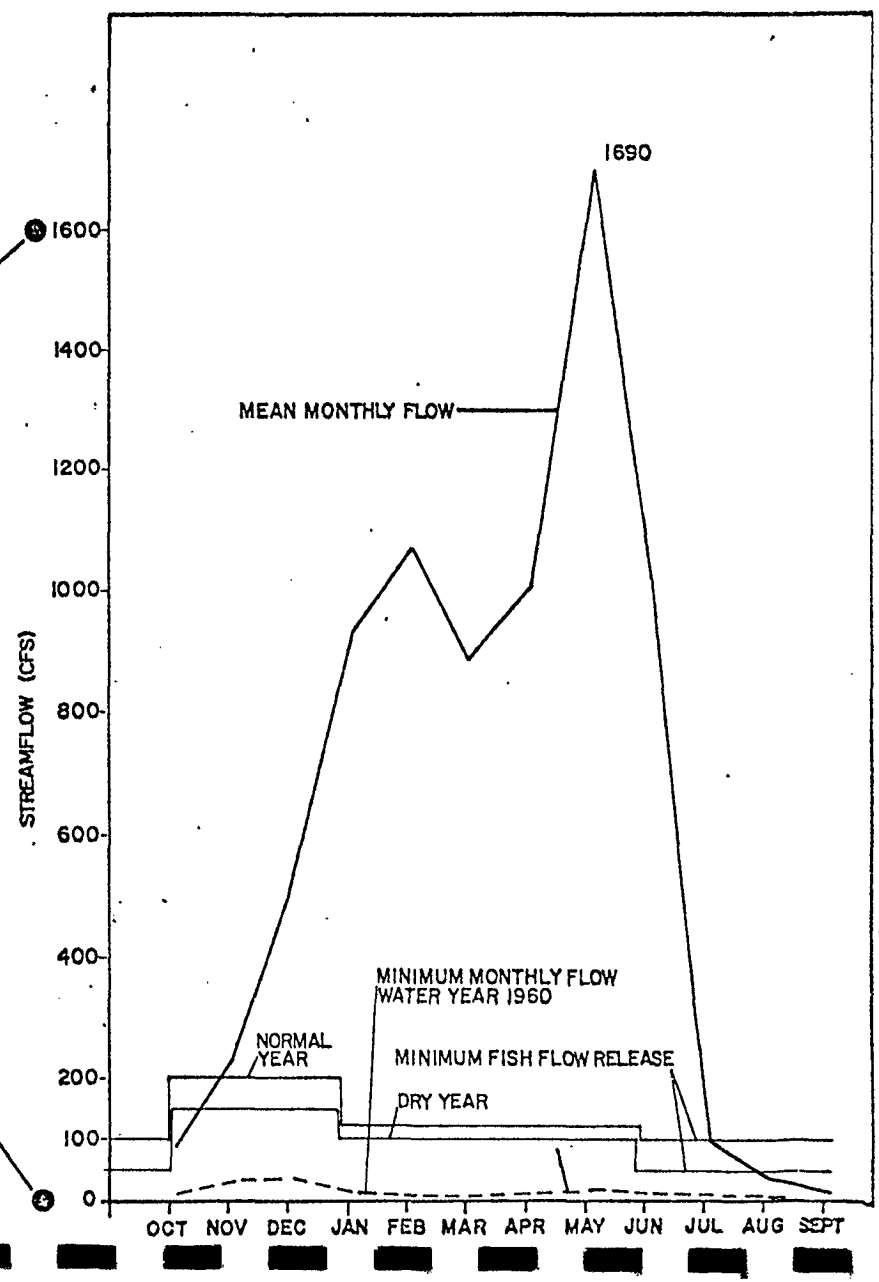


PRE-PROJECT: OCTOBER 1903 – SEPTEMBER 1911
GAUGE STATION NO. 172
SOURCE: USGS WATER SUPPLY PAPER 1315-A



POST-PROJECT: OCTOBER 1956 – SEPTEMBER 1973
GAUGE STATION NO. 11302000
SOURCE: USGS SURFACE WATER RECORDS VOL. 2

FIGURE 4
STREAMFLOW CONDITIONS, GOODWIN
DIVERSION DAM
STANISLAUS RIVER

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Presently streamflows in the lower reach of the Stanislaus River below the New Melones Dam site vary greatly with water year. Goodwin Dam, the diversion point for the Oakdale and South San Joaquin Canals, periodically causes dewatering of the river channel downstream of the dam (see Figure 4). Irrigation return flows below Goodwin Dam are of considerable quantity and maintain perennial flows downstream of Ripon (Table 1).

A comparison of mean monthly unimpaired runoff (natural) and impaired runoff recorded at three stream gauging stations downstream from Goodwin Dam for the period 1960 through 1970 is presented in Table 1 (Department of Fish and Game, 1972). The greatest change in streamflow from pre-1900 conditions is during the summer months, July through December, when the natural streamflows are reduced by 83 to 98 percent. There are no formal agreements or conditions to reserve instream flow releases for fish and wildlife included in any of the water rights permits issued for the existing water development (which include Goodwin, 1910, Tullock, 1957, and Melones, 1926, Dams).

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Table 1

STANISLAUS RIVER
Hydrology[1/]

I. Unimpaired Inflow to Melones Reservoir (calculated)

Mean Monthly Flow, 1901 through 1970

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANN.
cfs[2/]	160	385	708	1190	1702	2184	3532	4893	3349	999	238	114	1618

Mean Annual Runoff, 1901-1970 = 1,171,000 A.F./ANN.
Median Annual Runoff, 1901-1970 = 1,124,000 A.F./ANN.

II. Comparison of Unimpaired Flows and Impaired Flows at Various Gages

Mean Monthly Flows, 1960 through 1970, in cubic-feet-per-second

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	
A. Unimpaired Flow at Melones Dam	161	400	830	1803	1840	1670	3091	4526	3054	976	303	187	1,116,000 A.F./Yr.
B. Impaired Flow Below Goodwin Dam	113	199	757	1556	1309	981	1226	1740	1316	144	5	32	564,000 A.F./Yr.
C. Amount Diverted	48	201	73	320	531	689	1865	2786	1738	832	298	155	575,000 A.F./Yr.
D. Percent Reduction	30	50	9	18	29	41	60	62	57	85	98	83	
E. Impaired Flow at Orange Blossom Br.	140	229	768	1647	1432	1046	1289	1792	1431	184	33	58	603,000 A.F./Yr.
F. Increment, Goodwin Dam to Orange Blossom	27	30	11	91	123	65	63	52	115	40	28	26	
G. Impaired Flow at Ripon	293	313	796	1677	1525	1153	1412	1816	1546	358	164	214	677,000 A.F./Yr.
H. Increment, Goodwin Dam to Ripon	180	114	39	121	216	172	186	76	230	214	159	182	

1/ From Department of Water Resources and U. S. Geological Survey records
2/ c.f.s. means cubic-feet-per-second

The Stanislaus River downstream from Goodwin Dam supports resident populations of warmwater game species including large-mouth bass, smallmouth bass, channel and white catfish, black crappie, bluegills and green sunfish. Rainbow trout are present immediately below Goodwin Dam in limited numbers. Carp, Sacramento squawfish, hardhead suckers and other nongame species are numerous (California Department of Fish and Game, 1972).

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The anadromous fish populations below Goodwin Dam include king salmon, steelhead, striped bass, American shad and sturgeon. The lower reach of the Stanislaus, near its confluence with the San Joaquin River, supports spawning populations of striped bass during years of high discharge in the spring. Sturgeon are present in the lower river, but it is not known if the species spawn there. American shad spawn upstream to the section immediately below Goodwin Dam. An important sport fishery is provided by these three fish, but no estimates of population size or the amount of angler use were discovered.

King salmon may be the most important species present in the Stanislaus River below Goodwin Dam. Salmon production in the Stanislaus River contributes to sport and commercial catches in the ocean and the lower San Francisco Bay. The Stanislaus River king salmon run supported an average annual use of 10,000 angler days of sport fishing plus 348,000 pounds of commercial harvest according to estimates made by the Department of Fish and Game in 1962.

Before Goodwin Dam, the major spawning runs occurred in the spring and minor runs took place in the fall and winter. Upstream migration began in April, May and June. Salmon would reside in the deeper pools of the river as far upstream as the confluence of the North and Middle Forks. Spawning would take place in the fall and early winter when temperatures and streamflows became suitable for spawning activities.

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Large numbers of king salmon were utilized by Digger Indians of the Walla Tribe, by white settlers, and by bird and mammal predators. Fall spawning runs became predominant as the natural flows of the Stanislaus River were altered and upstream passage was blocked, first by Goodwin Dam in 1912 and later by Melones and Tullock Dams.

Estimates of the king salmon populations have been made since the fall of 1947 through spawning stock surveys conducted by the Department of Fish and Game (except for 1950 when no survey was conducted). Based on these surveys, the Department of Fish and Game estimated the salmon runs shown in Table 2.

Table 2

KING SALMON SPAWNING RUNS IN THE STANISLAUS RIVER

1947	13,000	1955	7,000	1963	200
1948	15,000	1956	5,000	1964	3,700
1949	8,000	1957	4,000	1965	2,200
1950	Unknown*	1958	6,000	1966	2,800
1951	4,000	1959	4,300	1967	11,900
1952	10,000	1960	8,000	1968	6,400
1953	35,000	1961	1,900	1969	12,300
1954	22,000	1962	300	1970	9,300
				1971	13,600

* No salmon count conducted in 1950.

Source: California Department of Fish and Game, 1972.

The alteration of salmon habitat caused a decline in the king salmon spawning runs. From the beginning in 1947 to the construction of Tullock Dam in 1959, fall salmon runs averaged about 11,000 fish. After completion of Tullock Dam, the average run decreased to 6,000 fish from 1960 to 1971. The average over the period of record (1947 to 1971) is 8,600 king salmon (Department of Fish and Game, 1972).

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King salmon spawning habitat was seriously altered from historic conditions by physical barriers (Goodwin Dam), reduction of streamflows, fluctuating streamflows due to hydroelectric power production, and high water temperatures. The spawning riffles were further reduced due to gravel mining activities, siltation and compaction, and the encroachment of riparian vegetation. The success of salmon spawning migrations was further limited by concentrations of dissolved oxygen less than 4-5 ppm.

III. Project Development

New Melones Dam and Reservoir was authorized by the Flood Control Act of December 22, 1944. This authorization was subsequently modified by the 1962 Flood Control Act. As authorized by Congress, New Melones Reservoir, upon completion of construction by the Corps of Engineers, will become a unit of the Bureau of Reclamation's CVP. Construction was initiated by the Corps of Engineers in 1966.

In 1972, the Bureau of Reclamation (bureau) filed a petition for assignment of two water rights applications held by the State of California (Water Application Nos. 14858 and 14859). At this same time, two new and separate applications were filed by the bureau (Water Application Nos. 19303 and 19304) for permits to appropriate unappropriated water in the Stanislaus River. Protests to these applications were filed by numerous individuals, companies, irrigation districts and public agencies

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including the Department of Fish and Game. A formal hearing was held before the State Water Resources Control Board (SWRCB) in October 1972. Decision No. 1422 was issued by the SWRCB in April 1973 as a result of the hearing and testimony.

The applications filed by the bureau (Nos. 14858 and 19304) list "fish culture" as a purpose of the project. The SWRCB's Decision 1422 stated that "the bureau proposes to release water from New Melones Reservoir for the preservation and enhancement of fish life, rather than actually engaging in the raising of fish, and the permits should be issued accordingly". Minimum instream flow requirements for the maintenance of fish life that were proposed by the Department of Fish and Game in 1972 are much greater than those proposed by the bureau.

The Department of Fish and Game's recommendations were presented in the document Report to the California State Water Resources Control Board on the Effects of the New Melones Project on Fish and Wildlife Resources of the Stanislaus River and Sacramento-San Joaquin Delta dated October 1972. The report summarizes the studies and techniques used by the department to determine the impact of the dam upon the fish and wildlife resources of the river and the minimum instream flow requirements.

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According to the Department of Fish and Game, the king salmon in the Stanislaus River is the river's most valuable fishery resource, which was estimated to have a monetary value of $300,000 per year.

Salmon spawning stock surveys conducted since 1947 by the department allowed for the enumeration of adult population levels.

The spawning habitat requirements of these populations were first quantified in 1960 by spawning gravel surveys done by the Department of Fish and Game and the U. S. Fish and Wildlife Service. Flow releases to maintain salmon spawning habitat were estimated from this cooperative study and incorporated in a joint project operation study done by the U. S. Corps of Engineers and the U. S. Bureau of Reclamation. This flow schedule as it is presented in the New Melones environmental impact report is shown in Table 3.

Table 3

MINIMUM FLOWS BELOW GOODWIN DAM
IN THE STANISLAUS RIVER FOR FISH LIFE

Period	Flows Below Goodwin Dam	
	Normal Year	Dry Year
1 Jan-31 May	125 c.f.s.	100 c.f.s.
1 Jun-30 Sep	100 c.f.s.	50 c.f.s.
1 Oct-31 Dec	200 c.f.s.	150 c.f.s.
Annual Releases	98,000 acre-feet	69,000 acre-feet

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The original streamflow schedule was designed from procedures described and used by Westgate (1956) on the Cosumnes River. This method, commonly referred to as the usable width method, is based on the amount of suitable spawning and egg incubation area present in a suitable gravel riffle during different streamflows. This technique has been used on various other California streams (American River, Feather River, Tuolumne River, Merced River and others) for evaluating minimum instream flow requirements on salmon spawning areas.

From the spawning gravel survey it was determined that a flow of 200 cfs provided the greatest amount of usable gravel for salmon spawning. Subsequent surveys conducted by the Department of Fish and Game in 1972 derived the same minimum instream flow requirements but employed different criteria.

At the time of the 1960 study, a stream section was considered "poor" for spawning if its depth was greater than three feet. In more recent studies, king salmon have been observed spawning at depths of 8 to 15 feet in the Feather and Sacramento Rivers (Department of Fish and Game, 1964).

The deletion of the maximum depth criteria in the recent study provided a significant increase in spawning gravels at a flow of 200 cfs with greater depths. However, the 1972 survey of the Stanislaus River revealed that 35 percent of the spawning gravels recorded in the early survey were lost or made unusable through vegetation encroachment or gravel mining operations. The department did not conduct an extensive survey

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to state the flow which would maximize the amount of spawning gravel, but did feel that the 200 cfs would provide sufficient spawning area to maintain the average historical spawning run of 8,600 king salmon.

The 1960 study did not consider other life cycle stages.

In the course of the 1972 Stanislaus River study the department discovered that spring streamflows are a major limiting factor to king salmon production in the Stanislaus River as well as adult spawning flows. This relationship was demonstrated by the correlation between flows during smolt migration and the return of adults 2.3 years later (Figure 3).

The department further tested the relationship by applying it to a similar but independent stream -- the Tuolumne River. In this case, the calculated correlation coefficient was 0.79. Spawning runs on the Stanislaus were also correlated with autumn streamflow patterns. The analogous correlation coefficient for October through December mean monthly flows was 0.51 as compared to 0.94 for spring flows. This difference was taken by the Department of Fish and Game to indicate that spring flows more significantly limit salmon populations in the Stanislaus.

Several environmental factors associated with increased spring flows would be expected to increase the survival of smolts. Those factors described in the Department of Fish and Game's 1972 report are listed below.

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1. Increased living space and shelter.
2. Decreased predation in the Stanislaus River and during downstream migration.
3. Decreased vulnerability to diversion through agricultural water intakes because the proportion of water diverted during higher flows is smaller.
4. Stimulation of downstream migration and provision of suitable flows along the river channel.

Trapping studies in the Stanislaus River have shown that there are two peaks of downstream migration of juvenile king salmon. The first peak of downstream migration occurs in March and April with a large percentage of the fish only one to two inches long. The second peak takes place in May and early June and is comprised of three to four inch fish. The larger fish migrating during the later season (May and early June) were considered to contribute substantially to the returning spawning runs (Department of Fish and Game, 1972).

Historically, flows peaked in May. The department concluded that "the peak flows during the peak in downstream migration of larger fish may well be important both in stimulating the migration and ensuring its success". It was further concluded by the department that "the most reasonable interpretation of the observed correlation is that spring flows are the most important factor (limiting factor) controlling the size of the salmon populations in the Stanislaus River, with survival being proportioned to flow".

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In order to quantify the streamflow necessary to maintain or enhance the historical average of 8,600 fish, the department used the streamflow population-mean flow relationship shown in Figure 5. From Figure 5, it can be seen that the mean March through June flow required to maintain an average run of 3,950 females or 8,600 salmon is 950 cfs.

The minimum summer instream flow requirements of the Stanislaus River were estimated by the department at 100 cfs during the months of July, August and September. These flows would provide the resident fish of the river and the steelhead and juvenile salmon that stay in freshwater for one year with the following environmental requirements.

1. Maintain suitable dissolved oxygen and temperature levels.
2. Maintain habitat by preventing vegetation encroachment on gravel riffles.
3. Maintain trout habitat in the river below Goodwin Dam to help replace 12 miles of the Stanislaus River inundated by the project.

Based upon the foregoing considerations and analyses, the Department of Fish and Game concluded that the following flow schedule is essential to preserve and maintain the salmon and other fishery resources of the Stanislaus River.

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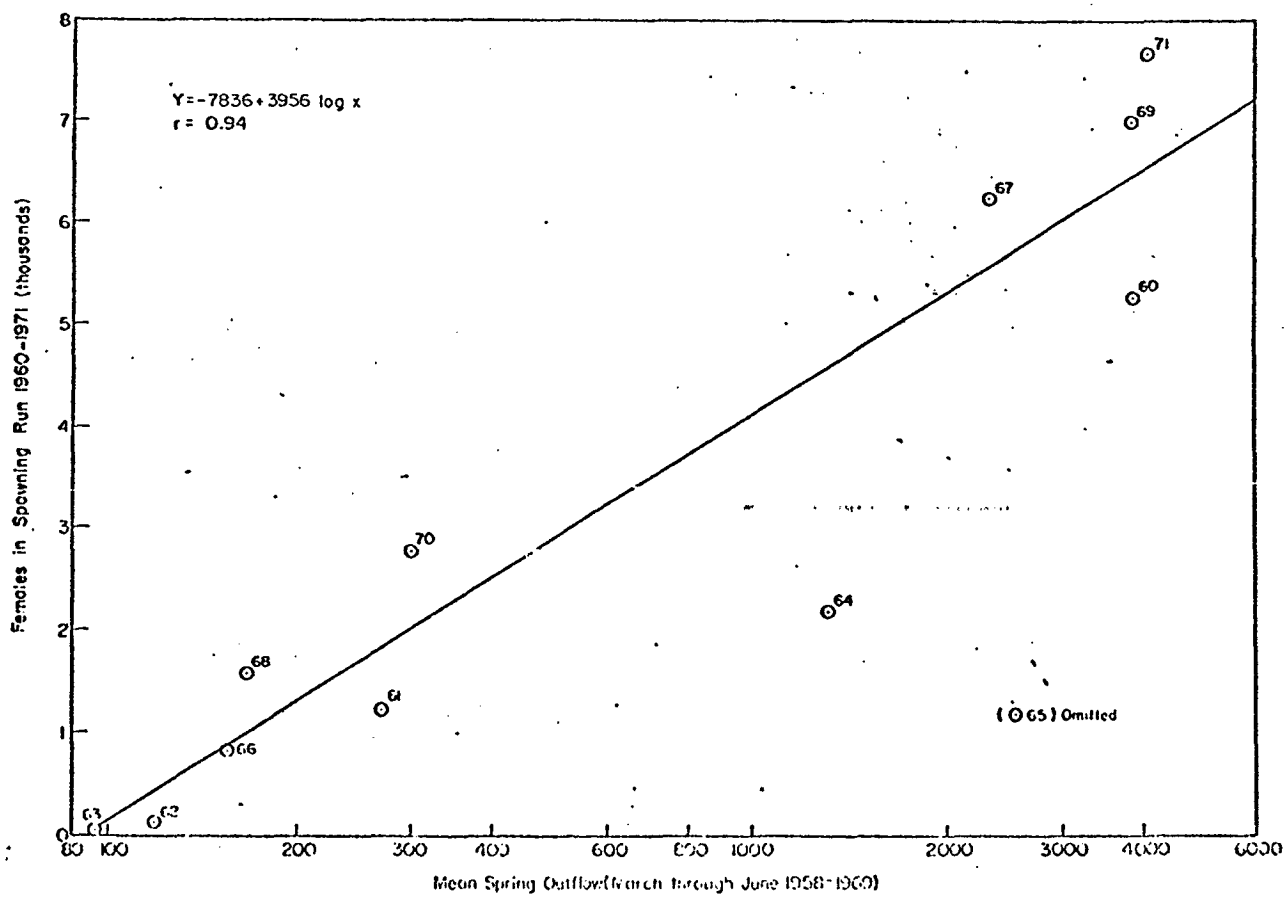
Figure 5



RELATIONSHIP BETWEEN SPRING OUTFLOW OF STANISLAUS RIVER AT RIPON AND NUMBER OF SPAWNING FEMALES 2-1/2 YEARS LATER (CIRCLED NUMBERS INDICATE YEAR OF SPAWNING).

Source: California Department of Fish and Game, 1972.

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Period	Minimum Flow (cfs)	Acre-Feet
January	150*	9,220
February	150*	8,330
March	700**	43,050
April	900**	53,550
May	1,200**	73,800
June	1,000**	59,500
July	100*	6,150
August	100*	6,150
September	100*	5,950
October	200*	12,300
November	200*	11,900
December	200*	12,300
		302,200

* The July through February flows should be released at Goodwin Dam (or Knights Ferry Diversion Dam) and allowed to flow, undiverted to the San Joaquin River.

** March through June flows should be measured at the Ripon streamflow gauge, with at least 83 percent of these mean monthly flows to be released from Goodwin Dam. This percentage is based on an average March-June accretion in this reach of 17% of the recommended mean flow of 950 cfs.

A dry year release schedule was also designed for the New Melones project. Other recommendations made by the Department of Fish and Game and the U. S. Fish and Wildlife Service included acquisition of all remaining salmon spawning gravels between Goodwin Dam and the Town of Riverbank, and operation of the project in such manner as to minimize detrimental flow fluctuations in the Stanislaus River below Goodwin Dam.

The 1972 Department of Fish and Game study also considered the potential effect of the New Melones project upon fisheries resources of the San Joaquin River and the Delta.

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The Department of Fish and Game (1972) report described several environmental conditions present in the Delta that are important to anadromous as well as resident fish populations in the Delta. The water quality conditions in the Delta can regulate the movements of upstream migrant salmon by the presence of depressed levels of dissolved oxygen (<5 ppm) (Department of Fish and Game, 1970). Also salinity levels can determine the spawning behavior of striped bass. Salinity gradients control the distribution of important fish food organisms (such as Neomysis). Temperature conditions are also critical to the survival of forage organisms (Neomysis) and upstream migrant salmon.

The presence of a minimum positive streamflow is the most important determining factor in providing the proper environmental conditions in the Delta. Fall and winter streamflows direct the upstream migration of salmon and spring outflow is directly related to the survival of young-of-the-year striped bass and salmon.

To help alleviate deficiencies in water quality and outflow to the Delta and assist in meeting established objectives of the State Delta Standards established in the Delta Water Rights Decision (D-1379), the Department of Fish and Game recommended the following:

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"In a normal water year, the addition to [sic] water allocated to fishery preservation in the Stanislaus River, 50,000 acre-feet should be allocated for use between August 1 and October 15. This water should be released at the direction of the Department of Fish and Game to the extent that it is needed to provide a minimum of 70 percent San Joaquin River water at Disappointment Slough on the San Joaquin River and at Rock Slough on Old River. In a dry year, this allocation should not be made.

"All flows provided for fishery purposes in the Stanislaus River from April through November should be maintained from the mouth of the Stanislaus River to Mossdale on the San Joaquin River for the purpose of preserving the fishery resources in the San Joaquin River downstream from the Stanislaus River and in the Sacramento-San Joaquin Delta."

There have been several actions taken by different agencies concerning water quality standards in the Delta as affected by New Melones.

The bureau under its agreement with the California Regional Water Quality Control Board (RWQCB), Central Valley Region, plans to release a maximum of 70,000 acre-feet of water in any one year as required to maintain a mean monthly TDS concentration in the San Joaquin River below the mouth of the Stanislaus River at 500 ppm maximum, also to maintain at least 5 ppm of dissolved oxygen (DO) in the Stanislaus River. These releases will be in addition to the bureau's planned fish releases which amount to 98,000 acre-feet in a normal year.

There was considerable evidence presented at the water rights hearing as to what are proper water quality objectives. The Department of Fish and Game has requested a minimum DO of 7 ppm to protect the salmon fishery. The SWRCB Interim Water

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Quality Control Plan, San Joaquin Basin 5C, specifies that as a result of waste discharges, the DO in the Stanislaus River should not fall below 85 percent of the saturation value, which is more restrictive than the DO standard of 5 ppm agreed upon by the bureau.

Also considered in the 1972 Department of Fish and Game study was the impact of the New Melones project on the wildlife resources of the Stanislaus drainage. To mitigate extensive loss of wildlife that will be associated with project construction, the following measures were considered necessary by the Department of Fish and Game:

"7. Selected retention of vegetation in the reservoir area between minimum and maximum pool lines.

"8. Planned retention of vegetation in recreational areas.

"9. Acquisition and development of a 2,520-acre wildlife area adjacent to the new reservoir.

"10. Acquisition of all remaining riparian habitat along the lower Stanislaus River (from Goodwin Dam to the mouth)."

Based on all the findings at the water rights hearing, the SWRCB concluded that Application Nos. 14858 and 14859 should be assigned to the bureau and that 19303 and 19304 should be approved in part. The approved storage at the dam was 980,000 acre-feet per annum less than the storage applied for by the bureau.

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The permit to be issued by the state to the bureau is subject to the following conditions concerning fish and wildlife preservation and water quality maintenance as described in Decision 1422.

Releases of Project Water for Preservation and Enhancement of Fishlife

> "Any permits issued pursuant to Applications 14858 and 19304 should contain terms requiring the release of up to 98,000 afa for maintenance of fish and wildlife as planned by the bureau to be released at a rate and during periods specified by the Department of Fish and Game. Jurisdiction should be reserved by the board to later revise the releases for preservation and enhancement of fish and wildlife upon reviewing the results of further studies, as mentioned above. Such studies were proposed by the bureau and agreed to by the Department of Fish and Game. The joint investigation should include an attempt to determine the optimum balance between maximizing fish and wildlife benefits while minimizing reservoir storage levels, during the period prior to storage of water for consumptive uses."

All arrangements for acquisition of wildlife habitat (riparian vegetation) along the river are between California Department of Fish and Game and U. S. Army Corps of Engineers. U. S. Bureau of Reclamation would be responsible for the control and operation of the dam.

In relation to the various water quality recommendations the board stated in Decision 1422 that:

> "In view of the uncertainty inherent in the problem of proper releases to protect water quality, any permits issued pursuant to subject applications should contain an interim term until further studies are made requiring releases of conserved water from New Melones which will maintain a mean monthly TDS

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concentration in the San Joaquin River at Vernalis of 500 ppm or less and a DO concentration in the Stanislaus River as specified in the Interim Water Quality Control Plan. The board should reserve jurisdiction over the permits for the purpose of revising water release requirements for water quality objectives."

Following the issuance of Decision 1422, the Federal Government sued the State of California to have Decision 1422 overturned. On October 9, 1975, the Federal Court ruled in favor of the Federal Government. The state has appealed the ruling and the hearing is scheduled for January 1977. In February 1976 the Corps of Engineers issued the request for bids on the final construction of the dam's powerhouse.

IV. Post-Project

Since the project is under construction and the water right permit is in litigation, there is no post-project period for analysis.

V. Conclusion

The U. S. Army Corps of Engineers is presently in the process of completing the multi-purpose New Melones project which will be operated and maintained by the U. S. Bureau of Reclamation. The State Water Resources Control Board has approved, in part, the bureau's applications to store the unappropriated water from the Stanislaus River in New Melones Dam and allocated a portion of the reservoir storage to an instream flow reservation for fish and wildlife. (The full operation of the project is a major controversy between

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the state and federal governments.) However, the instream flow reservation was based on a 1960 study conducted jointly by the U. S. Fish and Wildlife Service and the Department of Fish and Game. Recent Department of Fish and Game studies (1972) have shown the reservation to be inadequate. The most recent investigation describes the needs of juvenile salmon and smolts in greater detail. Greater instream flows are needed in March, April, May and June than were previously contemplated. Consequently, in the formal water rights hearing for the New Melones project (State Water Resources Control Board, D-1422), the Department of Fish and Game substituted a new minimum instream flow reservation need which was more than double the quantity requested by U. S. Fish and Wildlife Service and Department of Fish and Game in 1960, with all the increases occurring primarily in the spring and early summer (April, May and June).

Because the Department of Fish and Game had agreed to a release schedule in 1960, they were unsuccessful in revising the instream flow reservation during the formal hearing process. However, a condition in the water rights permit (State Water Resources Control Board, D-1422) does reserve the jurisdiction of the State Water Rights Board to revise the instream flow releases upon review of further fish and wildlife studies. Such studies were proposed by the bureau and have been agreed to by the Department of Fish and Game.

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Instream flow for fish life will be augmented by releases from the project for the maintenance of water quality standards in the lower San Joaquin River (State Water Resources Control Board, D-1379). These releases will be reserved under the jurisdiction of the State Water Resources Control Board and will be separate from fish flow releases as agreed to between the Regional Water Quality Control Board and the bureau.

Because the project is not complete and in operation, it is not possible to analyze the effects of streamflow alteration on fish and wildlife. The entire program for the project operation is currently undergoing further litigation between state and federal agencies concerned with the water project and the consequences of this litigation may or may not change the state's water rights decision on the project (D-1422).

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